



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/902,408	07/10/2001	Gerald T. Mearini	0937.0017	8259

7590 01/05/2005

D. Joseph English, Esquire  
Duane Morris LLP  
1667 K Street, NW  
Suite 700  
Washington, DC 20006

EXAMINER

HASSANZADEH, PARVIZ

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 01/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/902,408

Applicant(s)

MEARINI ET AL.

Examiner

Parviz Hassanzadeh

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 16-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 September 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election with traverse of claims 1-9 in the reply filed on 4/8/04 is acknowledged. Applicant's traverse of restriction requirement with respect to groups I and II is convincing and this part of the restriction requirement is withdrawn. Claims 1-15 will be examined together.

Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement with respect to group III (claims 16-20), the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 16-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected method claims, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 4/8/04.

### *Specification*

The disclosure is objected to because of the following informalities:

on page 1, line 18, it is suggested to change "demultiplexers" into "demultiplexers";

on page 3, line 9, it is suggested to change "FIGURE 1" into "Figure 1A and Figure 1B";

and

on page 9, lines 27-28, it is suggested to verify that electron gun as shown in Figure 5 is meant to be designated by reference character 14 rather than 12.

Appropriate correction is required.

### *Drawings*

Figures 1A and 1B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: in Figures 1A, 1B, the reference characters 10 through 32 are not described in the specification; and in Figure 5, reference characters 10, 12, 46, 48 and 50 are not described in the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be

Art Unit: 1763

notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1 and 11-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not provide an enabling disclosure for the use of an optical thickness monitor in combination with a quartz crystal monitor in the claimed invention as shown in Figure 2-5. In particular in claims 12 which requires both optical monitor (not shown in drawings) and the quartz crystal monitor 20 being located on a rotatable disk 34. as shown in Figures 2A and 2B, the QCM 20 is not located on disk 34.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 2, it is not clear whether the rotation mechanism (rotating means) is an integrated part of the fixture and thus being rotated with the fixture or whether it is an separate part causing the disk (rotating member) to be rotated.

In claim 7, the phrase “the substrate” refers to a single substrate whereas claim 6 refers to plural substrates.

In claim 10, it is not clear whether the rotating means is an integrated part of the fixture and thus being rotated with the fixture or whether it is a separate part causing the fixture to be rotated.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 2, 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhou et al (US Patent No. 6,039,806).**

Zhou et al teach a thin film deposition apparatus including a substrate support assembly (fixture) (Figs. 3, 4A) comprising: a thickness monitor 47; a rotating member 47 and a rotation mechanism 56; a shutter 66 for shuttering the fixture as shown in Figure 1; and substrate 20 supported on a substrate chuck (rotating member or disk) 50 as shown in Figure 4A. The

Art Unit: 1763

apparatus includes a plurality of substrate support assembly (fixtures) so that a plurality of substrate can be processed, that is, having high yield fixture (column 3, line 52 through column 4, line 45).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou et al (US Patent No. 6,039,806) in view of Ogure et al (US Patent No. 5,630,881).**

Zhou et al further teach that the rotating member 50 is a disk shape as shown in Figure 4A ; however, Zhou et al fail to disclose the disk adapted to be rotated at greater than 500 rpm.

Ogure et al teach a thin film forming apparatus (Fig. 1) including a susceptor (substrate holder) which is rotated using an induction motor 10 (magnetic induction rotating means) in order to increase the rotation speed of the susceptor as shown in Figure 2 (abstract and column 3, lines 30-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the rotation mechanism as taught by Ogure et al in the apparatus of Zhou et al in order to increase the rotation speed of the substrate holder which would increase the uniformity of the film formation across the surface of the substrate as shown in Fig. 2 of Ogure et al.

**Claims 4, 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou et al (US Patent No. 6,039,806) in view of Ogure et al (US Patent No. 5,630,881) as applied to claim 3 above , and further in view of Holland (US Patent No. 4,311,725).**

Zhou et al further teach an optical monitor 47 to monitor in-situ the coating material thickness on the corresponding substrate 20 (column 4, lines 8-19). However, Zhou et al fail to teach a quartz crystal monitor to monitor the thickness of the coating on the substrate.

Holland teach a thin film deposition apparatus (Figs. 5, 6) including a quartz crystal monitor 14 in combination with an optical monitor system in order to improve the thickness monitoring mechanism (column 4, lines 40-64, and column 7, line 43 through column 8, line 21).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the crystal monitor system as taught by Holland in the apparatus of Zhou et al in view of Ogure et al in order to further improve the accuracy of the thickness monitoring system.

**Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou et al (US Patent No. 6,039,806) in view of Ogure et al (US Patent No. 5,630,881)and Holland (US Patent No. 4,311,725) as applied to claims 4, 11 above, and further in view of Bloom (US Patent No. 3,573,190).**



Zhou et al in view of Ogure et al and Holland teach all limitations of the claims as discussed above except for the shutter means is a clam shell shutter.

Bloom teach a deposition apparatus (Fig. 1) including a shutter mechanism (Fig. 2) comprising a pair of shutters 38, 40 (clam shell shutter) serving as a substrate fixture shutter (column 2, lines 37-51).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the shutter mechanism as taught by Bloom in the apparatus of Zhou et al in view of Ogure et al and Holland as an art recognized equivalent for the same purpose of allowing deposition of the surface of the substrate only during deposition process and closing the shutter after the deposition process. See MPEP 2144.06, Art Recognized Equivalent for the Same Purpose, Substituting Equivalents Known for the Same Purpose (in re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982)).

**Claims 6-9, 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou et al (US Patent No. 6,039,806) in view of Ogure et al (US Patent No. 5,630,881), Holland (US Patent No. 4,311,725) and Bloom (US Patent No. 3,573,190) as applied to claims 4, 5, 11 above, and further in view of Tomofuji (US Patent No. 6,142,097).**

Zhou et al in view of Ogure et al, Holland and Bloom teach all limitations of the claims as discussed above except for the fixture comprising multiple substrates located concentrically about the monitor.

Tomofuji discloses a film forming apparatus (Fig. 8) including a substrate holder 2 holding a plurality of substrates 3 and an aperture 8 in the center of the substrate holder 2 for

Art Unit: 1763

fixing a quartz oscillator for monitoring thickness of a film formed on the substrates (column 1, lines 60-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the substrate support mechanism as taught by Tomofuji in the apparatus of Zhou et al in view of Ogure et al, Holland and Bloom as an art recognized equivalent mechanism of processing a plurality of substrates simultaneously. See MPEP 2144.06, Art Recognized Equivalent for the Same Purpose, Substituting Equivalents Known for the Same Purpose (in re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982)).

Further regarding claim 7 (*intended use*): inclusion of material or article worked upon by a structure does not impart patentability to the claims. *In re Young*, 75 F.2d 966, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

*Further regarding claims 8-9, 15*: as discussed above Ogure et al teach a thin film forming apparatus (Fig. 1) including a susceptor (substrate holder) which is rotated using an induction motor 10 (magnetic induction rotating means) in order to increase the rotation speed of the susceptor as shown in Figure 2 (abstract and column 3, lines 30-67).

**Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou et al (US Patent No. 6,039,806) in view of Ogure et al (US Patent No. 5,630,881), Holland (US Patent No. 4,311,725), Bloom (US Patent No. 3,573,190), Tomofuji (US Patent No. 6,142,097) and Kendrick et al (US Patent No. 5,025,664).**

Zhou et al in view of Ogure et al, Holland, Bloom and Tomofuji et al teach all limitations of the claims as discussed above except for the quartz crystal monitor comprising multi-crystal.


Kendrick et al teach multi-crystal quartz oscillator monitor in film forming process in order to reduce the down-time in a vacuum coating apparatus (column 1, lines 37-45).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement multi-crystal QCM in the apparatus of Zhou et al in view of Ogure et al, Holland, Bloom and Tomofuji et al in order to minimize the down-time of the apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (571)272-1435. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571)272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Parviz Hassanzadeh  
Primary Examiner  
Art Unit 1763

December 30, 2004